Russian Science Policy

from our Paris Correspondent

FOR a long time we have been waiting for the report on the USSR which has been prepared by a group of consultants brought together under the department for scientific affairs of the Organization for Economic Cooperation and Development. This report, written in quite unusual conditions, was begun almost clandestinely (the American delegates, among others, were not in favour of the operation) and as time went on encountered enormous obstacles, because the usual enquiry methods of the OECD investigators were not applicable to the USSR. Not only was it foolish to hope for the cooperation of Soviet experts or government departments, but even the most straightforward statistical data were hard to come by and difficult to exploit.

The Czech crisis seems to have wiped away any scruples which militated against publishing this work. The final decision to publish was taken at a meeting at OECD headquarters during the second half of December, and the report should appear in March or April 1969. There is no doubt that Kremlinologists and political scientists will find in the 750 pages or so of this immensely erudite book many points for controversy and criticism. But it is none the less true that, although some of the information is incomplete and certain interpretations need qualifying, this report will from now on provide an immeasurably valuable working tool. Several Russian specialists who read parts of the first draft are said to have found in it an assembly of data of which there is no equivalent in the USSR. But this obviously does not mean that they will necessarily ratify the conclusions (at times divergent, anyway) reached by the authors of the report.

After a brief introduction by M. Pierre Piganiol, the text breaks down into five main themes: Central Planning of Research and Development (E. Zaleski); Scientific and Engineering Manpower Resources (J. P. Kozlowski); Organization and Planning of Research and Development in the Higher Educational Estab-

lishments (H. Wienert); Organization and Planning of Research and Development in the Academy System (H. Wienert); Science and Industry in the USSR (R. Amman; M. J. Berry; R. W. Davies). There are also a glossary, tables and appendices with innumerable statistical data. Everything is accompanied by detailed references to sources.

Having rapidly examined this magnum opus, one could simplify things by tying down the evolution of problems of organizing research and development in the USSR to the story of a complicated game of see-saw between the "Ministerial System" and the "Academy System". What, according to the OECD consultants, were the characteristics of this evolution from 1965—the date at which the basic faults of the system were most acutely felt—until 1966, the closing date of the report? The last reform treated in the report, that of October 1965, shows a willingness to give firms more autonomy and to choose research projects more clearly than before on the basis of their economic value as investment. But how does one determine this profitability? The problem is not exclusively a Russian one and it has not been satisfactorily solved anywhere. The Soviet estimates of the average profitability of research and development in any case vary quite considerably, between 0.39 rouble and 1.35 roubles per rouble invested.

The coordination of research comes under the jurisdiction of three bodies: the State Committee for Science and Technology (whose importance appears to be declining); the Gosplan (whose influence in decision making appears to be increasing); and finally, the Academy of Sciences (whose influence has appreciably diminished). In 1957 the ministerial system controlled 82.5 per cent of scientific establishments and 79.5 per cent of scientific personnel. The various reforms made since then have strengthened this tendency and reduced the area reserved by the academy.

As far as manpower is concerned, the main trends in recent years lie in the considerable rise in quantity and quality of personnel. From 1961 to 1965, while the active population rose by 16.7 per cent, the numbers of scientists employed in the national economy rose by 64.4 per cent. The total number of engineers is something like 1,600,000, of whom approximately 600,000 are engaged in research and development (the figures, as in all comparable OECD statistics, refer to full-time equivalents, so that the real number of individuals is much higher). It is particularly interesting to note that among these engineers the proportion of people with high level diplomas is continually on the increase. Nearly 40 per cent of higher education graduates are in fact engineering graduates. Standards of quality also seem to be getting higher among the mass of scientists, with the notable exception of teachers, which may be a damaging factor in the long run. Teachers, particularly in secondary schools and technical institutes, often have inadequate qualifications (particularly in chemistry). As a profession, teaching, which is badly paid and generally

The Siberian Branch of the USSR Academy of Sciences at Novosibirsk.

neglected, does not attract enough first-class people.

The academy was for a long time the linch pin of the Russian, and subsequently Soviet, system of what was not yet called research and development. Its power, although much greater than its western counterparts (at the end of 1966 it still controlled 194 research establishments and 27,000 scientists), is no longer what it used to be. Sharp criticism in 1959 of the academy's lack of adaptability led to measures (in 1961 and 1965) which considerably reduced its role in the fields of applied research and development and made it concentrate essentially on fundamental research work. This distinction is, in actual fact, far less clear cut at present than the report suggests it will be in the future. So is the distinction between the USSR Academy of Sciences and the numerous vassal academies scattered over the whole of Soviet territory. Theoretically, the trend would lead to a kind of regional specialization by the different academies, each giving up the practice of dispersing its efforts into too many fields and concentrating its activities only on those branches of science appropriate to its historical or geographical position. Thus only the central academy would have any claim to universality. This feudal and Muscovite idea is, as may be expected, openly or covertly opposed by local academicians.

While a position of balance between centripetal and centrifugal tendencies does not yet appear to have been reached anywhere, there is one case at least where the centrifugal tendencies seem to be predominating quite easily. This is in the Siberian branch of the Academy of Sciences which is becoming more and more autonomous and is even getting its own vassal organizations. It is true that no efforts were spared to create around Novosibirsk a strong focal point for first rate scientific work (from 1958-64 between 35 and 40 per cent of the capital invested by the USSR Academy of Sciences was poured into Siberia).

It has long been appreciated in the USSR that, in order to turn out scientists worthy of the name, it is necessary to maintain important research work in higher education. However, only recently has a coherent policy on this question been formulated and sufficient resources made available. As yet, the expected results have not come about. Theoretically, the university as such concerns itself with fundamental research and specialist institutes are concerned with applied research. But both kinds of establishment complain bitterly of lack of material resources and, what is worse, of the terrible shortage of highly qualified personnel. In the USSR research workers prefer to work in centres dependent on the academy as they enjoy greater prestige and better material conditions than in the laboratories of the Vuzy, that is, the higher education system. Novosibirsk, where there is a good spirit of collaboration between the academy and the Vuzy, is something of an exception in the general climate of bitter competition. New proposals (in September 1966) calculated to increase the number of research contracts granted by industry to institutes and the universities should, however, allow the latter to benefit from supplementary resources.

The director of the Centre for Russian and East European Studies at the University of Birmingham, Professor R. W. Davies, is responsible, along with

two collaborators, for the penetrating and fairly harsh chapter on science and industry. From the outset, it underlines three factors operating against the attempt to reorganize research and development which has been so vigorously pursued for ten years. First, this attempt coincides with a period in which it has been decided to pay more attention to consumer industries and agriculture while launching military and space programmes that are as costly as they are ambitious. Second, as a direct result of the progress of the Soviet economy since the revolution, the "moment of truth" has come in the USSR. It is no longer a question of more or less imitating the West. This phase is substantially over. It is now a question of innovating. Lastly, the growing complexity of the Soviet economy now makes it impossible to call on the simplistic and authoritarian methods of planning which were formerly used.

What are the essential points arising from this densely written section, teeming with statistics? First of all, a comparison: between 1955 and 1965, the proportion of the GNP invested in research and development grew, in the USSR as in the US, from 1.5 per cent to approximately 3 per cent. The proportion of manpower in scientific and technical fields in relation to the total active population was the same on both sides, but the total number of research and development workers, in absolute terms, was greater in the USSR. Although the USSR has this numerical superiority, personnel productivity is appreciably lower than in America because the absolute value of capital investment is higher in the US.

The most serious problem concerns the relationship between research and development, the former generally having been wrongly privileged compared with the latter. In particular, this has caused a certain decline in qualified personnel in the development sector which contrasts strongly with often increasingly high standards in the research sector. On the other hand, industry strongly opposes the definite inertia with which innovation is regarded. The USSR is still paying for the conservatism which made it put its money, in the past, on coal as opposed to liquid fuel, on steam rather than diesel traction on the railways, on traditional construction methods as opposed to modern techniques. The chemical industry in particular has been the victim of this lack of foresight and courage. One should add that the concentration of research and development establishments dependent on the Ministerial system into a small number of units isolated from factories does not help at all the process of cooperation between research workers and industrialists. The result of all this, too often, is that industry is compelled to call on imported techniques (and we should not forget here that since July 1, 1965, the USSR has subscribed to the Paris Convention on patents) although the appropriate fundamental research has been carried on, sometimes long before, in Soviet laboratories. The increasing introduction of economic incentives for both individuals and firms, will, it is hoped, do something to remedy this situation. There would also need to be an accurate method of measuring the results of research. For this, the Basic Codex, in operation since 1964 (all estimates of research and development profitability should be measured according to its norms), is unfortunately an even more inaccurate tool than its Western counterparts.